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IS 3327 (1982): Pedal-operated Paddy Threshers [FAD 21:  
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**IS : 3327 - 1982**

*Indian Standard*  
SPECIFICATION FOR  
PEDAL-OPERATED PADDY THRESHERS  
( *First Revision* )

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**INDIAN STANDARDS INSTITUTION**  
**MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG**  
**NEW DELHI 110002**

# *Indian Standard*

## SPECIFICATION FOR PEDAL-OPERATED PADDY THRESHERS ( *First Revision* )

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**AMENDMENT NO. 1   APRIL 1998**  
**TO**  
**IS 3327 : 1982   SPECIFICATION FOR**  
**PEDAL-OPERATED PADDY THRESHERS**

*( First Revision )*

( *Page 5, Table 1, col 4* ) — Substitute 'IS 2062 : 1992†' for 'IS 226 : 1975†' and the corresponding title in the footnote as 'Steel for general structural purpose ( *fourth revision* )'.

( *Page 5, Table 1, Sl No. (xiv) and (xv)* ] — Substitute the following for the existing in respective columns:

(1)	(2)	(3)	(4)
xiv)	Pedal board	Wood or Mild Steel	IS 399 : 1963* IS 2062 : 1992†
xv)	Slate	do	do

( *Page 6, clause 5.2.1, first sentence* ) — Substitute the following for the existing:

'Each slat shall be at least 12 mm thick and 60 mm wide if made of wood and 0.5 to 0.8 mm thick and 45 mm wide if made of mild steel.'

( *Page 8, clause 5.3.5* ) — Substitute the following for the existing:

**'5.3.5 Pedal Board** — The pedal board shall be wooden plank having minimum size of 25 mm × 65 mm or of mild steel of minimum 0.5 mm × 45 mm and its length shall depend on the size of the cylinder.'

( FAD 59 )

*Indian Standard*  
SPECIFICATION FOR  
PEDAL-OPERATED PADDY THRESHERS  
( *First Revision* )

0. FOREWORD

**0.1** This Indian Standard ( First Revision ) was adopted by the Indian Standards Institution on 28 June 1982, after the draft finalized by the Harvesting and Threshing Equipment Sectional Committee had been approved by the Agricultural and Food Products Division Council.

**0.2** Conventional practice for threshing paddy is trampling with a team of bullocks on a specially prepared threshing floor or by beating the bundles of paddy sheaves. However, the pedal-operated paddy threshers are also now being used to some extent for this purpose.

**0.3** The paddy thresher of the pedal-operated type consists mainly of a well-balanced cylinder with series of threshing teeth fixed on slats and it is worked by a pedal and gear drive mechanism. While the cylinder is kept in rotary motion at high speed, the paddy sheaves in bundles of suitable size are held in contact with the teeth. The grains are separated by the combing as well as by the beating action of the threshing teeth. The thresher with a smaller cylinder is operated by one person and the one with a larger cylinder is operated by two persons. In the unit operated by two persons, the driving mechanism is fitted at both the ends of the cylinder.

**0.4** This standard covering the requirement of pedal-operated paddy thresher was first published in 1965. Since then considerable development has taken place in design of this type of threshers. A need was felt to revise this standard to make it up to date for better implementability.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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\*Rules for rounding off numerical values ( revised ).



## **IS : 3327 - 1982**

### **1. SCOPE**

**1.1** This standard prescribes the material, dimensional and other requirements for the pedal-operated paddy thresher.

### **2. TERMINOLOGY**

**2.0** For the purpose of this standard, the following definitions shall apply.

**2.1 Cylinder** — The rotary member of the thresher on which the slats with the threshing teeth are fitted.

**2.2 Pedal Operated** — Operated by the foot of the operator.

**2.3 Size** — The threshing length of the cylinder ( *see A* in Fig. 1 ).

**2.4 Slats** — The members of the cylinder on which the threshing teeth are fitted.

**2.5 Threshing Teeth** — The hooks of the thresher which separate the grains from the harvested crops.

### **3. SIZES**

**3.1** Size of the thresher shall be up to 600 mm in case of one-person operated thresher and up to 800 mm in case of two-person operated thresher.

**3.1.1** A tolerance of  $\pm 5$  mm shall be permitted on the declared size, subject to the size remaining within the specified limits ( *see 3.1* ).

### **4. MATERIALS**

**4.1** The material used for various parts of the paddy thresher ( *see* Fig. 1 ) shall be as given in col 3 of Table 1. The material may conform to the relevant standards indicated in col 4 of Table 1.

### **5. CONSTRUCTIONAL REQUIREMENTS**

**5.1 Body Frame** — The body frame of the paddy thresher shall consist of the base, the side frames and the front grain shield. The rear grain shield may also be provided.

**5.1.1 Base** — The wooden base shall be at least 50 × 50 mm size. The wooden parts shall be joined to each other by mortise and tenon joints. The base shall be fixed to the side frames ( *see 5.1.2* ) with carriage bolts. The base may also be of mild steel angle section of nominal size of at least 30 × 30 × 3 mm and the parts in this case shall be welded to the side frames.

TABLE 1 MATERIALS FOR VARIOUS COMPONENTS

( Clause 4.1 )

SL No.	COMPONENT	MATERIAL	APPLICABLE STANDARD
(1)	(2)	(3)	(4)
i)	Base	Wood or Mild Steel	IS : 399-1963* IS : 226-1975† IS : 1977-1975‡
ii)	Front grain shield	do	do
iii)	Side frames	Mild steel	IS : 226-1975† IS : 1977-1975‡
iv)	Side boards	do	do
v)	Cylinder end discs	do	do
vi)	Crank	do	do
vii)	Axles	do	do
viii)	Pedal frame fulcrum	do	do
ix)	Pedal frame	do	do
x)	Rear grain shield	Mild steel or Canvas	IS : 226-1975† IS : 1977-1975‡
xi)	Threshing teeth	Spring steel wire or Mild steel wire	IS : 4454 ( Part I )-1975§ IS : 280-1978
xii)	Gears	Cast iron	IS : 210-1978¶
xiii)	Gear housing	Cast iron or Aluminium alloy or Mild steel	IS : 210-1978¶ IS : 617-1975** IS : 226-1975† IS : 1977-1975‡
xiv)	Pedal board	Wood	IS : 399-1963*
xv)	Slats	do	do

NOTE — Wood used for various components should preferably be teak, SAL or BABUL.

\*Classification of commercial timbers and their zonal distribution ( revised ).

†Specification for structural steel ( standard quality ) ( fifth revision ).

‡Specification for structural steel ( ordinary quality ) ( second revision ).

§Specification for steel wires for cold formed springs : Part I Patented and cold drawn steel wires — unalloyed ( first revision ).

||Specification for mild steel wire for general engineering purposes ( third revision ).

¶Specification for grey iron castings ( third revision ).

\*\*Specification for aluminium and aluminium alloy ingots and casting for general engineering purposes ( second revision ).

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**5.1.2 Side Frames** — The side frames shall be of mild steel angle section of nominal size of at least  $30 \times 30 \times 3$  mm and the parts shall be welded or bolted. The side frames shall support side boards which shall be made of mild steel sheet of thickness 0.5 to 0.8 mm and these shall be bolted to the side frames. The side boards may be webbed.

**5.1.3 Front Grain Shield** — The front grain shield shall be at least 12 mm thick wooden plank or 0.5 to 0.8 mm thick mild steel sheet and it shall be fixed suitably to the side frames.

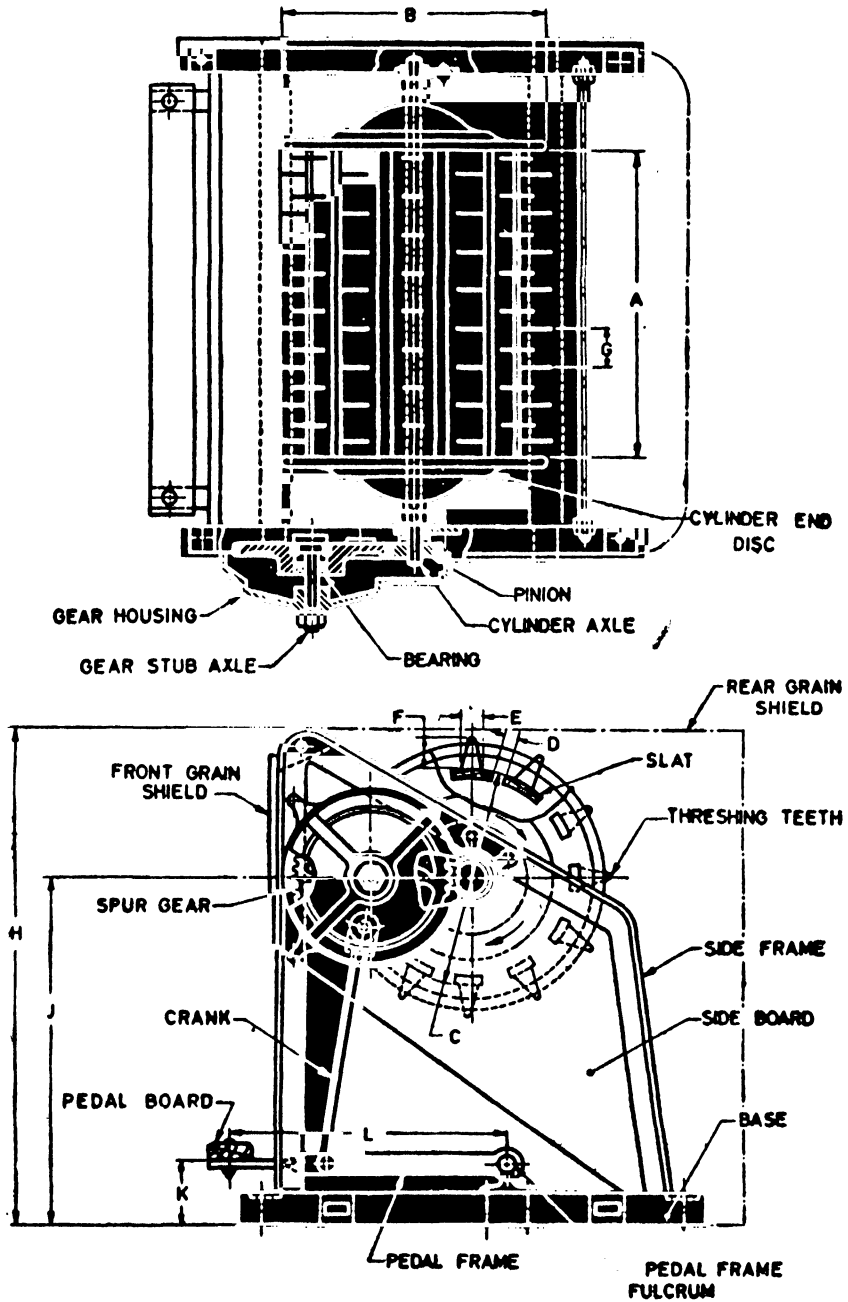
**5.1.4 Rear Grain Shield** — If provided, the rear grain shield shall be of either mild steel sheet having the same thickness as the side boards or canvas supported by at least three mild steel flat frames each of minimum  $50 \times 3$  mm size. In case the rear grain shield is made of canvas supported by mild steel flats, the shield shall be so fabricated that it may be easily folded or entirely removed, when not in use.

**5.2 Cylinder** — The cylinder shall be constructed of a series of slats supported on each of its two sides by a cylinder end disc. The slats shall carry the threshing teeth. In case of the thresher operated by two persons, the cylinder shall be suitably reinforced at its centre. The diameter of the cylinder across the end discs ( *see B* in Fig. 1 ) shall be in the range of 400 mm and 430 mm.

**5.2.1 Slat** — Each slat shall be at least 12 mm thick and 60 mm wide. The slats shall be fixed to the cylinder end discs. The diameter of the cylinder across the slats ( *see C* in Fig. 1 ) shall be in the range of 300 mm and 330 mm. The distance between the two slats ( *see D* in Fig. 1 ) shall be in the range of 12 mm and 20 mm.

**5.2.2 Cylinder End Discs** — The cylinder end discs to support the slats may be webbed in order to reinforce them. The thickness of the sheet used in case of single disc shall be at least 1.5 mm. In case of double disc, the thickness of each disc shall be minimum 0.6 mm and the total thickness of two discs shall be minimum 1.5 mm. Mild steel bar of 6 mm diameter shall be rolled or welded along the edges of the discs.

**5.2.3 Threshing Teeth** — The threshing teeth shall be of at least 3 mm diameter. The wire shall be curved and fixed to the slats in such a way that the distance between the bottom ends of each teeth ( *see E* in Fig. 1 ) shall be in the range of 25 mm and 32 mm. The threshing teeth shall project out 50 mm above the surface of the slats ( *see F* in Fig. 1 ). The methods of fixing of the threshing teeth on the slat shall be such that when assembled, the threshing teeth on the two adjacent slats come staggered to each other. The distance between the tip of the two adjacent teeth ( *see G* in Fig. 1 ) shall be between 50 to 75 mm.



All dimensions in millimetres.

FIG. 1 PADDY THRESHER, PEDAL-OPERATED

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**5.3 Drive** — The drive shall be of eccentric type. The drive shall consist of a crank, one end of which shall be connected to the spur gear and the other end shall be connected suitably to the pedal frame fulcrum which shall be welded to the pedal frame. The pedal frame shall carry the pedal board.

NOTE — The thresher is normally operated with a speed of 400 rev/min.

**5.3.1 Gear Housing** — The gear housing shall consist of the spur gear which shall engage the pinion. The gear ratio shall be not less than 3.5:1.

**5.3.2 Crank** — The crank shall be made of bar of not less than 9 mm in diameter. This shall preferably be 'U' shaped.

**5.3.3 Pedal Frame Fulcrum** — The fulcrum shall be made of mild steel tube or bar. In case mild steel tube is used, the inside diameter and thickness shall be at least 20 mm and 2.5 mm respectively, while in case of the bar, it shall be either round or square with 30 mm diameter or sides respectively.

**5.3.4 Pedal Frame** — The pedal frame shall be of mild steel flat of at least 30 × 5 mm size.

**5.3.5 Pedal Board** — The pedal board shall be of wooden plank having minimum size of 25 × 65 mm and its length shall depend upon the size of the cylinder.

**5.4 Axles** — The cylinder axle and the gear stub axle shall be of mild steel round bar having a diameter between 16 and 20 mm. The axle shall be supported by ball or bush bearing or by bearings with loose balls in cup and cones, and these shall be guarded suitably.

## **6. DIMENSIONS**

**6.1** The overall height of the thresher ( *see H* in Fig. 1 ) shall be not more than 750 mm.

**6.2** The height between the ground level and the centre of cylinder ( *see J* in Fig. 1 ) shall be not more than 525 mm.

**6.3** The height of the pedal board from the ground level ( *see K* in Fig. 1 ) shall be 75 to 80 mm.

**6.4** The distance between the centre of pedal board and the centre of pedal fulcrum ( *see L* in Fig. 1 ) shall be  $360 \pm 10$  mm.

## **7. OTHER REQUIREMENTS**

**7.1 Clearances** — The clearance between the frame and the tips of the threshing teeth shall be at least 50 mm. There shall be a clearance of at least 200 mm between the rear grain shield and tips of the threshing teeth.

**7.2 Lubrication** — The gear housing shall be provided with protected oil holes to facilitate lubrication of gears and provision shall also be made for easy opening of bearing cones for greasing of bearing balls.

**7.3 Safety Arrangement** — The metallic and wooden edges of the paddy thresher shall be rounded in order to protect the operator from possible injuries. The necessary safety aid shall be built in to prevent the possible detachment of certain parts and thin injuries to flying over, leading to the operator, while the thresher attains high rotary speed due to the centrifugal force.

## **8. TESTS**

**8.1** The setting strength of the threshing teeth shall be such that when pulled by a force of 500 N, the teeth shall not come out of the slats.

**8.2** When placed on a level surface and operated at the maximum working speed, following shall not occur:

- a) Oscillation of the thresher,
- b) Undue vibration and unbalancing of the cylinder, and
- c) Feet of the operator shall not touch the rear grain shield.

## **9. WORKMANSHIP AND FINISH**

**9.1** All the metallic parts of the thresher shall be given an anticorrosive rust preventive paint. The wooden parts shall be painted before assembly. The gear and bearings shall be well lubricated.

## **10. MARKING**

**10.1** The paddy thresher shall be marked with the following particulars:

- a) Manufacturer's name and recognized trade-mark, if any;
- b) Rotational speed; and
- c) Size of thresher.

**10.1.1** The particulars mentioned under **10.1** shall be punched or stencilled on the base of the thresher.

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**10.1.2** Each paddy thresher may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act, and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## **11. SAMPLING FOR LOT ACCEPTANCE**

**11.1** Unless otherwise agreed to between the purchaser and the supplier, the sampling of the thresher for lot acceptance shall be done in accordance with **3** of IS : 7201-1974.\*

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\*Method of sampling of agricultural machinery and tractors.

## INTERNATIONAL SYSTEM OF UNITS ( SI UNITS )

### Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

### Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

### Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s <sup>2</sup>
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb m <sup>-2</sup>
Frequency	hertz	Hz	1 Hz = 1 c/s (s <sup>-1</sup> )
Electric conductance	siemens	S	1 S = 1 A V
Electromotive force	volt	V	1 V = 1 W A
Pressure, stress	pascal	Pa	1 Pa = 1 N m <sup>-2</sup>

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